

STRAIT OF JUAN DE FUCA — EASTERN STRAIT **COASTAL CUTTHROAT**

STOCK DEFINITION AND ORIGIN

The Eastern Strait coastal cutthroat stock complex has been identified as distinct based on the geographic distribution of its spawning grounds. This stock complex is composed of coastal cutthroat trout in drainages flowing into Admiralty Inlet and in drainages flowing north into the eastern Strait of Juan de Fuca (from Discovery Bay west to Bagley Creek). Admiralty Inlet drainages include tributaries of Port Ludlow, Mats Mats Bay, Oak Bay, and Port Townsend Bay, namely Ludlow Creek, Chimacum Creek, and several unnamed independent tributaries. Along the eastern Strait of Juan de Fuca, drainages include Snow, Salmon, Contractors, and Eagle creeks and several unnamed independent tributaries in Discovery Bay; Jimmy-Come-Lately, Dean, and Johnson creeks and several unnamed independent tributaries in Sequim Bay; the Dungeness and Gray Wolf rivers; Bell, Gierin, Cassalery, McDonald, Siebert, and Bagley creeks, and several unnamed independent tributaries flowing directly into the eastern Strait of Juan de Fuca.

These drainages originate in the foothills of the Olympic Mountains, with the exception of the Dungeness and Gray Wolf rivers which drain the north slopes of some of the higher peaks of the Olympic Range. Most drainages flowing from the foothills of the Olympic Mountains contain low to moderate gradients in the lower watersheds and steep gradients in the upper watersheds which are often impassable to anadromous fish. However, some drainages in this area are typical lowland streams with generally low to moderate gradients dependent on groundwater run-off for year-round flows. Drainages in this area lie in a rainshadow cast by the Olympic Range which influences streamflow characteristics (Williams et al. 1975, McHenry et al. 1996).

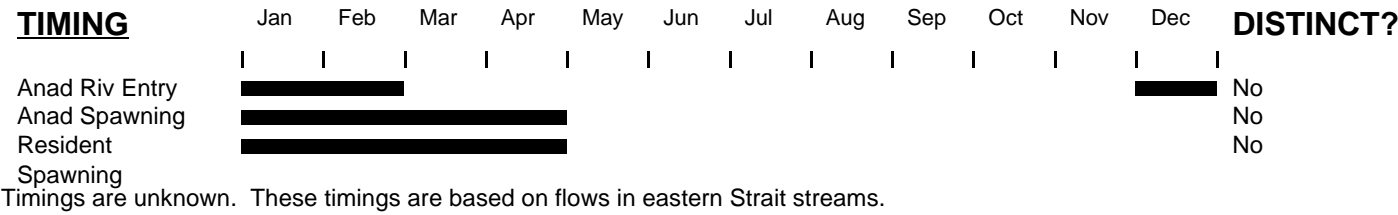
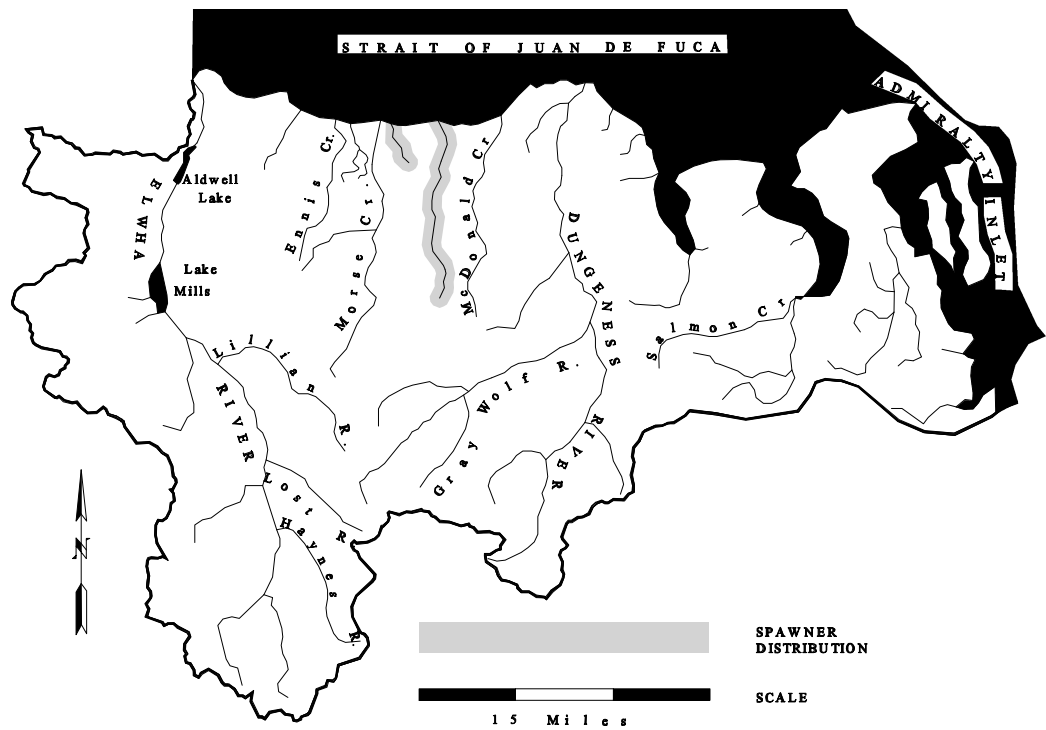
Wild coastal cutthroat in this stock complex are native and sustained by natural production. Greater or fewer numbers of distinct spawning populations may be identified once comprehensive genetic, life history, and ecological information is available. During 1995, coastal cutthroat samples were collected along the Strait of Juan de Fuca for genetic analysis from Gierin Creek (Eastern Strait complex), Lees, Peabody, and Whiskey creeks (Mid-Strait complex), and Bear Creek, a Hoko River tributary (Western Strait complex). The Gierin Creek collection from the Eastern Strait stock complex was genetically distinct from collections from the Mid-Strait and Western Strait stock complexes.

Anadromous coastal cutthroat in the Eastern Strait complex are predominantly late-entry fish, but early-entry cutthroat may be present in the Dungeness River system. Resident cutthroat are likely present upstream of most barriers to anadromous fish. We

STOCK DEFINITION PROFILE for Eastern Strait Coastal Cutthroat

SPAWNER DISTRIBUTION

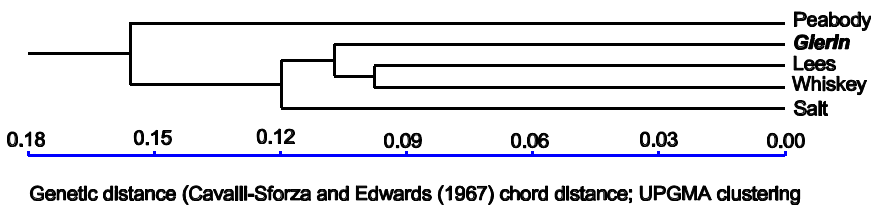
DISTINCT? - UNKNOWN



BIOLOGICAL CHARACTERISTICS

DISTINCT? - Unknown

GENETICS - The Gierin Cr. collection (N=60), made in 1995, was significantly different from all Mid-Strait stock complex collections (33 allozyme-locus G-tests; $P<0.001$).



STOCK STATUS PROFILE for Eastern Strait Coastal Cutthroat

STOCK ASSESSMENT

DATA QUALITY -----> No Data

Return Years				
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AVERAGE RUNSIZE DISTRIBUTION

Data not available.

STOCK SUMMARY

Stock Origin

Native

Production Type

Wild

Stock Distinction

Distribution

Stock Status

Unknown

Screening Criteria

do not know if there are fluvial or adfluvial life history forms of coastal cutthroat in this stock complex. Specific spawn timing is unknown but is probably from January through April for all life history forms in most Eastern Strait streams.

STOCK STATUS

The status of the Eastern Strait stock complex is Unknown. Information from trap counts (targeted or incidental) and smolt trapping or electrofishing is available but is insufficient to permit status determination.

Naturally small anadromous cutthroat populations are present in Snow and Salmon creeks. From about 1975 through 1985, fewer than about 25 cutthroat adults were trapped annually in Snow Creek, and fewer than about 80 cutthroat adults were trapped annually in Salmon Creek (WDFW files, Michael 1989). Cutthroat smolt abundance information is available from trap counts at Snow Creek for the 1978 through 1985 outmigration years and at Salmon Creek for the 1978 through 1985 outmigration years. Cutthroat smolt abundance in Snow Creek has remained low (fewer than 50 smolts), but relatively stable. Trapping was discontinued in Salmon Creek in 1985, but cutthroat smolt abundance there showed a declining trend.

While quantitative data useful for trend analysis are limited, coastal cutthroat were found to be abundant in a variety of streams sampled during the course of genetic investigations in 1995. In addition, juvenile abundance and presence/absence information is available in a variety of streams.

FACTORS AFFECTING PRODUCTION

Habitat--Habitat factors limiting production include altered annual instream flow regimes primarily due to water withdrawals, channelization and diking and the associated habitat degradation, seasonal flooding and low summer flows, loss of stream access due to human-caused barriers to migration, water quality and quantity problems in the areas of concentrated land development, degraded instream and riparian habitat, land conversions from forest to agricultural or residential use, and alteration and loss of wetlands and estuarine habitats (Williams et al. 1975; Nelson et al. 1992; Washington Department of Fish and Wildlife and Western Washington Treaty Indian Tribes 1994; Orsborn and Ralph 1994; McHenry et al. 1996).

Harvest Management--Many of the streams in this complex are closed to all fishing. In waters that are open the statewide general fishing season (June 1 through October 31) and standard regulations in streams, rivers, and beaver ponds (two trout per day, eight-inch minimum size limit), protect resident juveniles and migrating smolts from harvest. Where adult anadromous fish and fisheries exist, regulations in freshwater allow a two-fish daily limit, with a 14-inch minimum size limit. The 14-inch minimum size limit is based on

data on length frequency, age, and sexual maturity, and protects first-time spawners and some repeat spawners from harvest.

Hatchery--There have been no releases of hatchery coastal cutthroat trout in this area. Interactions with other hatchery-origin salmonids have not been examined. The Dungeness River receives annual releases of approximately 10,000 winter steelhead smolts.

STRAIT OF JUAN DE FUCA — MID-STRAIT COASTAL CUTTHROAT

STOCK DEFINITION AND ORIGIN

The Mid-Strait coastal cutthroat stock complex has been identified as distinct based on the geographic distribution of its spawning grounds. This stock complex is comprised of coastal cutthroat trout in drainages flowing north into mid-Strait of Juan de Fuca region. From east to west, drainages include Morse, Lees, Ennis, Peabody, Valley, Tumwater, Dry, Colville, Salt, Whiskey, Field, Murdock, Deep, Joe, and Jim creeks and unnamed independent tributaries. Larger rivers include the Elwha, Lyre, East Twin and West Twin.

The mid-Strait of Juan de Fuca region is a transitional zone between the wetter, western strait and the rain shadow of the eastern strait. Drainages comprising the Mid-Strait stock complex originate in the foothills of the Olympic Mountains, with the exception of the Elwha River, which is glacially fed and drains the north slopes of Mount Olympus. Most drainages flowing from the foothills of the Olympic Mountains contain low to moderate gradients in the lower watersheds and steep gradients in the upper watersheds which are often impassable to anadromous fish. However, some drainages in this area are typical lowland streams with generally low to moderate gradients dependent on groundwater run-off for year-round flows. Several of the larger streams have a tidal influence extending upstream for several miles creating extensive estuaries (Williams et al. 1975, McHenry et al. 1996).

Wild coastal cutthroat in this stock complex are native and are sustained by wild production. Greater or fewer numbers of distinct spawning populations may be identified once comprehensive genetic, life history, and ecological information is available. During 1995, WDFW collected coastal cutthroat samples for genetic analysis from Lees, Peabody, and Whiskey creeks in the mid-Strait region. All of these samples were genetically distinct from one another and from a sample from Gierin Creek in the Eastern Strait stock complex. Olympic National Park (ONP) staff initiated genetic sampling of Lake Crescent coastal cutthroat populations in 1995, however, results of these analyses are not yet available.

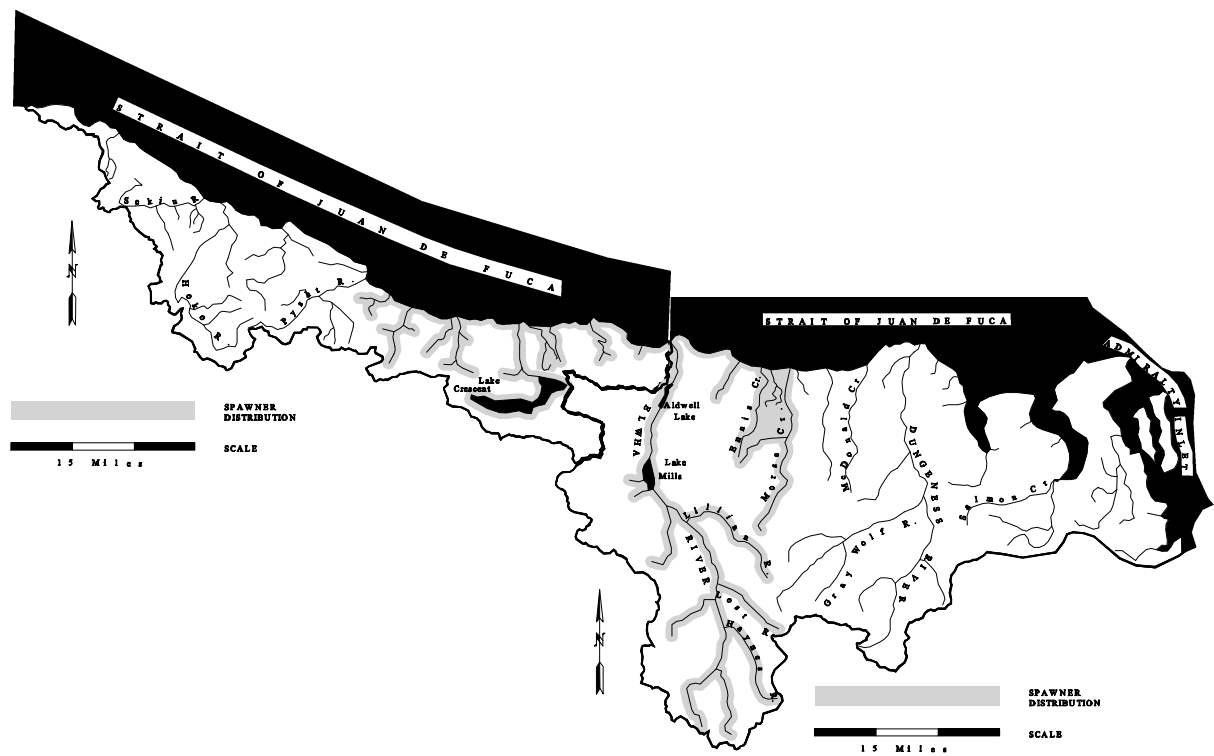
Anadromous coastal cutthroat in the Mid-Strait complex are predominantly late-entry fish, but early-entry cutthroat may be present in the Elwha River. Resident cutthroat are likely present upstream of most barriers to anadromous fish.

Lake Crescent contains unique, locally-adapted coastal cutthroat trout and rainbow trout populations, a hybrid cutthroat-rainbow population (in Barnes Creek), and a cutthroat population in the upper portion of the outlet stream, the Lyre River. Lake Crescent is a large, deep, oligotrophic lake located between the main range of the Olympic Mountains

STOCK DEFINITION PROFILE for Mid-Strait Coastal Cutthroat

SPAWNER DISTRIBUTION

DISTINCT? - UNKNOWN



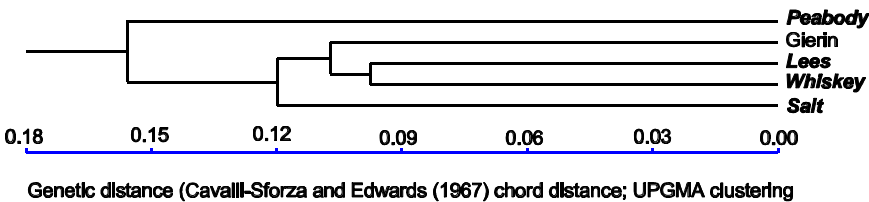
TIMING	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	DISTINCT?
Anad Riv Entry													No
Anad Spawning													No
Resident Spawning													No

Timings are unknown. These timings are based on flows in mid-Strait streams.

BIOLOGICAL CHARACTERISTICS

DISTINCT? - Unknown

GENETICS - The Peabody Cr (N=59), Salt Cr. (N=39), Lee's Cr. (N=55), and Whiskey Cr. (N=48) collections, made in 1995, differed significantly from one another and from the Eastern Strait stock complex collections (33 allozyme-locus G-tests; $P<0.001$).



STOCK STATUS PROFILE for Mid-Strait Coastal Cutthroat

STOCK ASSESSMENT

DATA QUALITY -----> Fair

Return Years	ESCAPE Redds	ESCAPE Redds		
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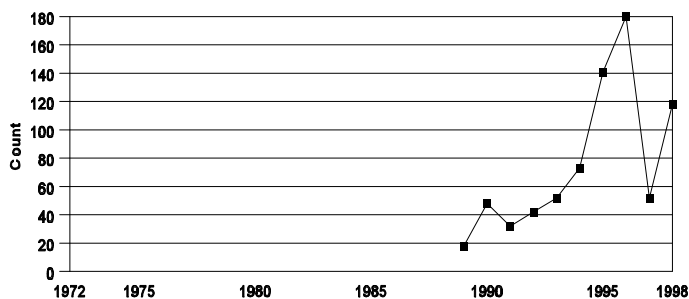
1972
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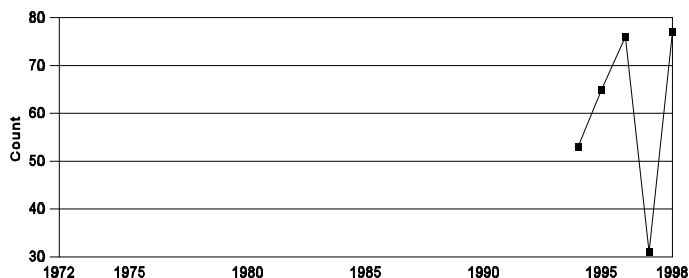
Escapement

Number of Redds



Escapement

Number of Redds



Col. 1 Barnes Cr; Col. 2 Lyre River

AVERAGE RUNSIZE DISTRIBUTION

Data not available.

STOCK SUMMARY

Stock Origin

Native

Production Type

Wild

Stock Distinction

Distribution

Stock Status

Unknown

Screening Criteria

and the coastal foothills along the Strait of Juan de Fuca. An impassable barrier falls in the Lyre River isolated Lake Crescent about 500 years ago (Behnke 1979, Pierce 1984, McHenry et al. 1996). Lake Sutherland also supports a coastal cutthroat population. We do not know if there are other fluvial or adfluvial forms of coastal cutthroat in this stock complex. Specific spawn timing is unknown, but is probably from January through April for all life history forms in most mid-Strait drainages. Coastal cutthroat have been observed spawning in mid-November downstream from Lake Crescent in the upper Lyre River and Boundary Creek, a tributary to the Lyre River (John Meyer, ONP, personal communication), several months earlier than other cutthroat populations.

STOCK STATUS

The status of the Mid-Strait stock complex is Unknown. While quantitative data useful for trend analysis are limited, coastal cutthroat were found to be abundant in a variety of drainages sampled during the course of genetic investigations in 1995. In addition, juvenile abundance and presence/absence information is available from electrofishing or smolt trapping in a variety of streams.

In the Lake Crescent system, spawner surveys for cutthroat redds have been conducted by ONP staff on Barnes Creek since 1989. In Barnes Creek, a total of 18, 48, 32, 42, 52, 73, 141, 180, and 52 redds were observed from 1989 through 1997, respectively. Since 1994, ONP staff have monitored a previously unknown (presumed cutthroat) spawning population downstream of the park boundary in the Lyre River and Boundary Creek. A total of 53, 65, 76, 31, and 77 redds were observed from 1994 through 1998, respectively (J. Meyer, ONP, personal communication).

FACTORS AFFECTING PRODUCTION

Habitat--Major limiting habitat factors include altered annual instream flow regimes and associated seasonal flooding and low summer flows, loss of access due to human-caused barriers, water quality and quantity problems in the areas of concentrated land development, degraded instream and riparian habitat, land conversions from forest to agricultural or residential use, and alteration and loss of wetlands and estuarine habitats (Williams et al. 1975, McHenry et al. 1996).

Harvest Management--The statewide general fishing season (June 1 through October 31) and standard regulations in streams, rivers, and beaver ponds (two-trout per day, eight-inch minimum size limit), protect resident juveniles and migrating smolts from harvest. Where adult anadromous fish and freshwater fisheries exist, regulations allow a two-fish daily limit, with a 14-inch minimum size limit. The 14-inch minimum size limit is based on data on length frequency, age, and sexual maturity, and is intended to protect first-time spawners and some repeat spawners from harvest. Beginning with the 1994 season, the National Park Service changed the minimum size limit in Lake Crescent from

12 inches to 20 inches to allow a greater proportion of fish to spawn and to shift the size distribution closer to the historic age structure (Olympic National Park 1994).

Hatchery--There have been no releases of hatchery coastal cutthroat trout in this area. Interactions with other hatchery-origin salmonids have not been examined. Elwha River continues to receive plants of winter steelhead, with an annual goal of 155,000 smolts. Summer steelhead are also released annually into the Elwha (10,000) and Lyre (10,000).

STRAIT OF JUAN DE FUCA — WESTERN STRAIT **COASTAL CUTTHROAT**

STOCK DEFINITION AND ORIGIN

The Western Strait coastal cutthroat stock complex has been identified as distinct based on the geographic distribution of its spawning grounds. This stock complex is composed of coastal cutthroat trout in drainages flowing north into the western Strait of Juan de Fuca (from the Pysht River west to Cape Flattery). Drainages include the Pysht, Clallam, Hoko, Sekiu and Sail rivers and Falls, Olsen, Jansen, Rasmussen, Bullman, Snow, Agency, Village, Classet, Middle, and Beach creeks and unnamed independent tributaries.

Drainages comprising the Western Strait stock complex originate in the foothills of the Olympic Mountains and share characteristics such as size, aspect, hydrology, and land use. Most streams contain low to moderate gradients in the lower watersheds and steep gradients in the upper watersheds which are often impassable to anadromous fish. However, some drainages in this area are typical lowland streams with generally low to moderate gradients dependent on groundwater run-off for year-round flows. Several of the larger streams have a tidal influence extending upstream for several miles creating extensive estuaries (Williams et al. 1975, McHenry et al. 1996).

We know that anadromous and resident life history forms are present in the Western Strait stock complex. Resident cutthroat are likely present upstream of most barriers to anadromous fish. It is unknown whether there are fluvial or adfluvial forms of coastal cutthroat in this stock complex.

Anadromous coastal cutthroat in the Western Strait stock complex are predominantly late entry. Specific spawn timing is unknown but is probably from January through April for all life history forms in most western Strait drainages.

Greater or fewer numbers of distinct spawning populations may be identified once comprehensive genetic, life history, and ecological information is available. During 1995, coastal cutthroat samples were collected for genetic analysis from Bear Creek, a Hoko River tributary. Results of this analysis are not yet available.

Wild coastal cutthroat in this stock complex are native and sustained by natural production.

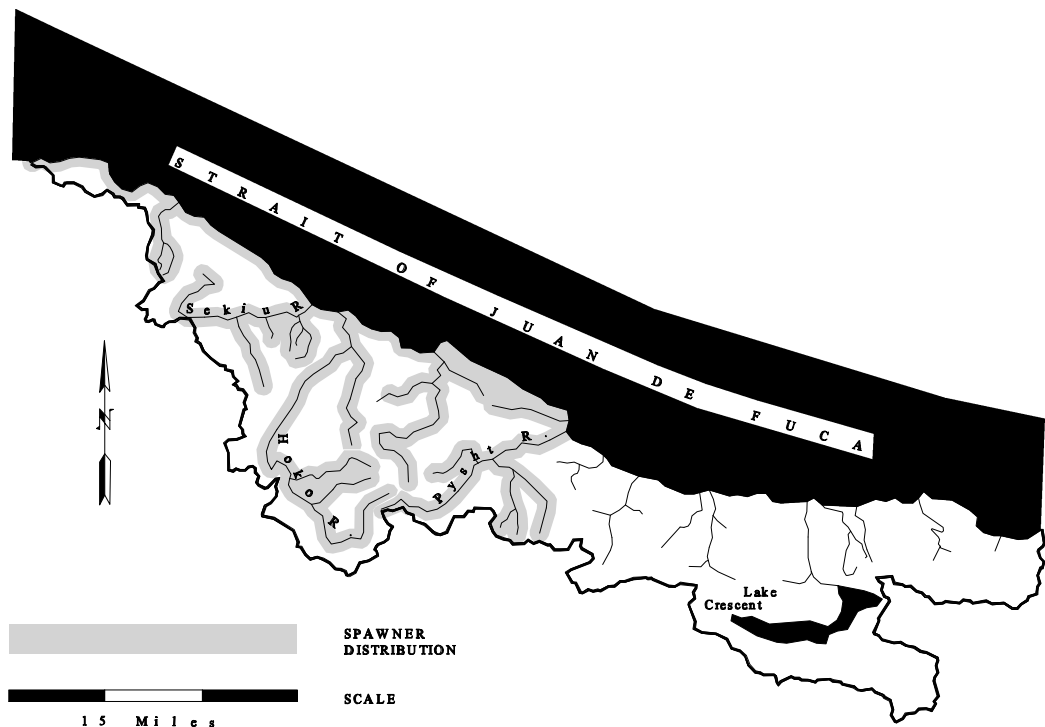
STOCK STATUS

The status of the Western Strait stock complex is Unknown. Available quantitative data on abundance or survival are insufficient to assess stock status. While quantitative data

STOCK DEFINITION PROFILE for Western Strait Coastal Cutthroat

SPAWNER DISTRIBUTION

DISTINCT? - UNKNOWN



TIMING

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	DISTINCT?
Anad Riv Entry													No
Anad Spawning													No
Resident													No
Spawning													No

Timings are unknown. These timings are based on flows in western Strait streams.

BIOLOGICAL CHARACTERISTICS

DISTINCT? - Unknown

STOCK STATUS PROFILE for Western Strait Coastal Cutthroat

STOCK ASSESSMENT

DATA QUALITY -----> No Data

Return Years				
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AVERAGE RUNSIZE DISTRIBUTION

Data not available.

STOCK SUMMARY

Stock Origin

Native

Production Type

Wild

Stock Distinction

Distribution

Stock Status

Unknown

Screening Criteria

useful for trend analysis are limited, juvenile abundance and presence/absence information is available for a variety of streams.

FACTORS AFFECTING PRODUCTION

Habitat--Habitat factors limiting production include altered annual instream flow regimes and associated seasonal flooding and low summer flows, loss of access due to human-caused barriers, elevated water temperatures, increased sedimentation and other water quality and quantity problems, degraded instream and riparian habitat, land conversions from forest to agricultural or residential use, and alteration and loss of wetlands and estuarine habitats (Williams et al. 1975, McHenry et al. 1996).

Harvest Management--The statewide general fishing season (June 1 through October 31) and standard regulations in streams, rivers, and beaver ponds (two-trout per day, eight-inch minimum size limit), protect resident juveniles and migrating smolts from harvest. Where adult anadromous populations and freshwater fisheries exist, regulations allow a two-fish daily limit, with a 14-inch minimum size limit. The 14-inch minimum size limit is based on data on length frequency, age, and sexual maturity, and protects first-time spawners and some repeat spawners from harvest.

Hatchery--There have been no releases of hatchery-origin coastal cutthroat trout in this area. Interactions with other hatchery-origin salmonids have not been examined. Hatchery winter steelhead releases include annual releases into the Hoko (20,000), Sail (10,000) and Sekiu (10,000) rivers.